January 18, 2021 Reference No. 11204375

Jalal El-Jayyousi, P.E.
MDNR – Hazardous Waste Program
1730 Elm Street
PO Box 176
Jefferson City, MO 65102-0176

MOD095 046306

Dear Mr. El-Jayyousi:

Re: 2020 Second Semi-Annual Progress Report
July 2020 through December 2020
Docket No. RCRA-07-2004-0034
Sedalia, Missouri – Former MP Shops

This letter presents the 2020 Second Semi-Annual Progress Report (SAPR) of activities completed for the Union Pacific Railroad (UPRR) Sedalia Facility pursuant to the Administrative Order on Consent between UPRR and the United States Environmental Protection Agency (USEPA) effective on March 4, 2004. The period for this report is July 2020 through December 2020.

1. Work Performed

The following work was performed during this reporting period:

1. The 2020 First Semi-Annual RS-1 recovery system sampling results were submitted to the City of Sedalia and Missouri Department of Natural Resources (MDNR) in a report dated July 29, 2020.
2. The 2020 First SAPR was submitted to MDNR on July 29, 2020.
3. The 2020 First Semi-Annual RS-1 Discharge Report was submitted to the City of Sedalia on July 29, 2020.
4. When Gehm Environmental visited the Site to collect the recovery trench sample on December 9, 2020, the pump was not operating, and they were unable to restore electricity. No system malfunction messages were received, so we were not able to determine how long the pump was inoperable. On December 16, 2020, an electrician visited the site and restored power to the pump, and the discharge volume was determined. The RS-1 recovery system was sampled on December 16, 2020, in accordance with the March 19, 2009 letter from the City of Sedalia.

- Volatile organic compounds (VOCs) concentrations from this sampling event were added to determine a Total Toxic Organics (TTO) discharge concentration of 0.0122 mg/L, which is well below the City of Sedalia's discharge limit of 2.13 mg/L

RCRA 1/18/2021

597755

GHD
3807 South 148th Street Omaha Nebraska 68144 USA
T 402 778 4801 F 402 778 4807 W www.ghd.com

2. Project Work for the Next Reporting Period

The following work is anticipated to be performed during the next reporting period:

1. The Annual Environmental Covenant Compliance Report will be submitted to MDNR in January 2021.
2. The Semi-Annual Discharge Monitoring Report will be submitted to the City in January 2021.
3. The 2020 Annual Groundwater Monitoring Report will be submitted to MDNR and USEPA in February 2021.
4. A Site-wide asbestos containing material (ACM) inspection and abatement will be conducted in March or April 2021. The ACM Inspection and Abatement Report will be prepared for submittal in June or July 2021.
5. The 2021 annual groundwater monitoring event will be performed in April 2021. A summary of the results will be provided in the next progress report.
6. The annual inspection of the consolidation area vegetative cover will be performed in April 2021. Based on observations during this inspection, mowing and brush removal of the consolidation area will be conducted, if necessary.
7. The RS-1 recovery system will be sampled in June 2021, and a SAPR will be submitted to the City.

Please contact me at (402) 778-4801 or at robyn.hansen@ghd.com if you have any questions.

Sincerely,

GHD

Robyn Hansen

RH/mk/04

cc: Mr. Jim Brannen, UPRR
Robert Aston, USEPA (1 copy; RCRA Docket No. VII-90-H-0024)

January 18, 2021 Reference No. 11204375

Mr. Gary Guillory
City of Sedalia
Water Pollution Control Program
200 South Osage
Sedalia, MO 65301

Dear Mr. Guillory:

Re: 2020 Second Semi-Annual Discharge Report
UPRR Sedalia, Missouri
Former MP Shops

On behalf of Union Pacific Railroad (UPRR), GHD Services Inc. (GHD) has prepared this semi-annual report regarding the water discharge from the Groundwater Recovery System (RS-1 System), located at the UPRR Sedalia Former MP Shops facility in Sedalia, Missouri.

The information presented in this document has been assembled in accordance with the discharge application letter dated February 28, 1995, and the City of Sedalia's response dated March 23, 1995. Analytical results are compared to the City of Sedalia's discharge limit of 2.13 milligrams per liter (mg/L) for Total Toxic Organics (TTO).

In accordance with the March 19, 2009, letter from the City of Sedalia, semi-annual monitoring of the trench began on June 4, 2009, and has continued every June and December thereafter. When Gehm Environmental visited the site to collect the recovery trench sample on December 9, 2020, the pump was not operating, and they were unable to restore electricity. No system malfunction messages were received, so we were not able to determine how long the pump was inoperable. On December 16, 2020, an electrician visited the site and restored power to the pump, and the discharge volume was determined. UPRR reports the analytical results and cumulative volume of discharged water to the City of Sedalia Public Works Director on a semi-annual basis.

Table 1 summarizes the December 16, 2020, sampling results. All analytical results are displayed in mg/L.

Table 1 Discharge Sampling Results from December 16, 2020

Date	cis-1,2,-Dichloroethene (cis-1,2-DCE) (mg/L)	trans-1,2-Dichloroethene (trans-1,2-DCE) (mg/L)	Tetrachloroethene (PCE) (mg/L)	Trichloroethene (TCE) (mg/L)	Vinyl Chloride (VC) (mg/L)	Total Toxic Organics (TTO) (mg/L)
12/16/20	0.0036	0.00036 J	0.0038	0.0028	0.0016	0.0122

ND = not detected J = data was qualified by lab

GHD
3807 South 148th Street Omaha Nebraska 68144 USA
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Table 2 provides the average discharge flow rate and cumulative-volume of water discharged from July 2020 – December 2020 by the RS-1 system.

Table 2 Discharge Flowrate and Volume from July 2020 – December 2020

Average Discharge Flow Rate (07/14/2020 – 12/16/2020) (gpm)	Cumulative Volume (07/14/2020 – 12/16/2020) (gallons)
0.01	1,275

Volatile organic compound (VOC) detections for the December 2020 sampling event were summed to determine the TTO discharge, as shown in Table 1. The TTO concentration is well below the City of Sedalia's discharge limit of 2.13 mg/L.

The analytical data provided by Pace Laboratory was reviewed to assess data quality in terms of precision and accuracy. Results from trip blanks, laboratory blanks, method calibrations, surrogate recoveries, and control sample analyses were reviewed by GHD. Sample holding times and preservation were also assessed. All data quality elements were satisfied.

Historical analytical results and meter readings are attached in Table 3. The laboratory analytical report, chain-of-custody form, and data validation memo for the December 2020 sampling event are also attached.

If you have any questions, please contact me at (402) 778-4801 or robyn.hansen@ghd.com.

Sincerely,

GHD

Robyn Hansen

RH/mk/03

Encl. Table 3: Cumulative Flow and Analytical Results
Attachment 1: Analytical Report
Attachment 2: Data Validation Memo

cc: Jim Brannen, UPRR
Robert Aston, USEPA (1 copy; RCRA Docket No. VII-90-H-0024)
Jalal El-Jayyousi, MDNR (2 copies)

Table 3
Cumulative Flow and Analytical Results

Table 3
Cumulative Flow and Analytical Results
Former MP Shops
Sedalia, Missouri

Sample Date	Cumulative Volume	Average Flow Rate	cis-1,2-Dichloroethene (cis-1,2-DCE)	trans-1,2-Dichloroethene (trans-1,2-DCE)	Tetrachloroethene (PCE)	Trichloroethene (TCE)	Vinyl Chloride (VC)	Total Toxic Organics (TTO)	Period Discharge
	Gallons	GPM	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	Gallons
06/28/1995	0	-			System started at 2:00 p.m.				
06/29/1995	5,371	3.7	0.01700	0.00320	0.03400	0.01700	ND	0.1300	
07/18/1995	73,000	2.5	0.01400	0.01100	0.04000	0.03300	0.01300	0.1110	
09/28/1995	253,318	1.7	0.06700	0.01200	0.11000	0.05400	0.01500	0.2600	
12/19/1995	439,419	1.6	0.11000	0.02200	0.12000	0.06500	0.01000	0.3270	
02/13/1996	-	-	0.07300	0.01500	0.11000	0.05800	0.00210	0.2581	
04/25/1996	656,818	1.2	0.05000	0.01200	0.06400	0.03200	0.01100	0.1690	
08/28/1996	1,059,777	2.2	-	0.00700	0.06200	0.04900	0.00450	0.1225	
10/16/1996	1,173,961	1.6	0.06000	0.01000	0.13000	0.06500	0.00290	0.2679	
04/01/1997	1,864,960	2.9	0.04100	0.00880	0.06900	0.03500	0.00100	0.1548	
05/02/1997	2,052,599	4.2	0.03300	0.00690	0.04500	0.02900	ND	0.1139	
08/19/1997	2,321,764	1.7	0.01400	0.00470	0.03200	0.01900	0.00360	0.0733	
10/08/1997	2,458,454	1.9	0.04000	0.00640	0.06900	0.01800	ND	0.1334	
03/30/1998	2,976,273	2.1	0.02300	0.00520	0.04900	0.02500	0.00140	0.1036	
06/29/1998	3,386,071	3.1	0.01850	0.00400	0.02430	0.01950	ND	0.0663	
09/25/1998	3,835,186	3.5	0.01730	0.00400	0.02690	ND	ND	0.0482	
01/18/1999	4,249,989	2.5	0.01670	0.00470	0.02500	0.01640	ND	0.0628	
04/06/1999	4,880,439	5.6	0.02440	0.00490	0.03420	0.02430	ND	0.0878	
06/24/1999	5,350,498	4.1	0.02260	0.00445	0.03380	0.02110	ND	0.0820	
09/28/1999	5,503,302	1.1	0.02140	ND	0.01780	0.01630	0.01020	0.0657	
12/09/1999	5,564,053	0.6	0.02710	0.006470	0.02030	0.01300	ND	0.0669	
04/12/2000	5,866,035	1.7	0.03400	0.006000	0.05400	0.03100	ND	0.1250	
07/21/2000	6,047,025	1.3	0.01700	0.003000	0.02900	0.01400	0.00210	0.0651	
09/26/2000	6,174,103	1.3	0.01400	ND	0.02760	0.01380	ND	0.0554	
12/28/2000	-	-	-	-	-	-	-	-	
03/19/2001	-	0	0.00590	0.00120	0.01400	0.00630	ND	0.0274	
06/06/2001	-	0	0.00180	ND	0.00660	0.00021	ND	0.0086	
09/24/2001	6,176,634	0	0.01700	0.00330	0.03100	0.01500	0.00240	0.0687	
12/03/2001	6,192,107	0.2	0.01180	0.00280	0.03290	0.01370	ND	0.0612	
03/13/2002	6,228,838	0.3	0.01320	0.00270	0.02800	0.01310	ND	0.0570	
06/11/2002	6,301,708	0.6	0.01360	0.00190	0.02240	0.01110	0.00150	0.0505	
10/03/2002	6,321,535	0.1	0.01320	0.00280	0.03380	0.01720	ND	0.0670	
12/02/2002	6,329,756	0.1	0.02020	0.00400	0.04340	0.02050	0.00180	0.0899	

"-" = Information not applicable or not available.
ND = not detected

Table 3
Cumulative Flow and Analytical Results
Former MP Shops
Sedalia, Missouri

Sample Date	Cumulative Volume	Average Flow Rate	cis-1,2-Dichloroethene (cis-1,2-DCE)	trans-1,2-Dichloroethene (trans-1,2-DCE)	Tetrachloroethene (PCE)	Trichloroethene (TCE)	Vinyl Chloride (VC)	Total Toxic Organics (TTO)	Period Discharge
	Gallons	GPM	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	Gallons
03/20/2003	6,360,787	0.2	0.01020	0.00220	0.01820	0.01310	ND	0.0437	
06/02/2003	6,406,209	0.2	0.00172	ND	0.00524	0.00291	ND	0.0099	
09/24/2003	6,514,341	0.7	0.00738	0.001160	0.01200	0.01120	ND	0.0317	
12/14/2003	6,557,765	0.4	0.00469	ND	0.00491	0.00498	ND	0.0146	
03/31/2004	6,557,770	0	-	-	-	-	-	-	5
06/07/2004	6,564,680	0.1	0.01300	0.00240	0.03360	0.01420	ND	0.0632	6,910
01/10/2005	6,597,100	0.1	-	-	-	-	-	-	32,420
04/04/2005	6,618,095	0.2	0.00998	0.00154	0.01730	0.00832	0.00287	0.0371	20,995
06/15/2005	6,627,592	0.1	0.01580	0.00265	0.02410	0.01370	ND	0.0563	9,497
06/28/2005	6,630,725	0.2	-	-	-	-	-	-	3,133
08/25/2005	6,636,549	0.1	0.00944	0.001840	0.032400	0.01320	ND	0.0569	5,824
12/14/2005	6,657,970	0.1	0.01750	0.002880	0.033500	0.02030	ND	0.0742	21,421
04/04/2006	6,674,418	0.1	0.01540	0.002750	0.031900	0.01670	ND	0.0668	16,448
06/12/2006	6,684,232	0.1	0.01950	0.003370	0.033800	0.01910	ND	0.0758	9,814
09/18/2006	6,688,419	0	0.01340	0.002580	0.033600	0.01740	ND	0.0670	4,187
12/14/2006	6,694,830	0.1	0.00834	0.001810	0.021600	0.00970	ND	0.0415	6,411
03/06/2007	6,705,780	0.1	0.01510	0.002220	0.026100	0.01320	ND	0.0566	10,950
07/06/2007	6,730,522	0.1	0.00961	0.001850	0.021700	0.01150	ND	0.0447	24,742
09/27/2007	6,733,698	0.03	0.01650	0.003670	0.033900	0.01740	ND	0.0715	3,176
12/06/2007	6,735,910	0.02	0.02360	0.004100	0.050100	ND	ND	0.0778	2,212
03/13/2008	6,747,390	0.08	0.01680	0.002760	0.027000	0.01520	ND	0.0618	11,480
06/20/2008	6,793,187	0.32	0.00174	ND	0.008220	0.00329	ND	0.0133	48,797
09/11/2008	6,804,478	0.09	0.01220	0.002040	0.023000	0.01220	ND	0.0474	11,291
12/18/2008	6,823,822	0.14	0.00661	ND	0.013700	0.00651	ND	0.0268	19,344
02/26/2009	6,838,863	0.15	0.01170	0.001850	0.019000	0.01080	ND	0.0434	15,041
06/04/2009	6,893,748	0.39	0.00777	0.001260	0.011200	0.00684	ND	0.0271	54,885
12/29/2009	6,933,824	0.13	0.00249	ND	0.004040	0.00179	ND	0.0083	40,076
06/03/2010	7,033,718	0.44	0.00959	0.00190	0.017000	0.00842	ND	0.0369	99,894
12/15/2010	7,064,515	0.11	0.00945	0.00128	0.017100	0.00908	ND	0.0369	30,797
06/06/2011	7,145,481	0.33	0.00881	0.00160	0.018600	0.00912	ND	0.0381	80,966
12/21/2011	7,157,336	0.04	0.00482	ND	0.004150	0.00308	ND	0.0121	11,855
06/14/2012	7,209,808	0.21	0.0237	0.00274	0.0272	0.0143	0.00907	0.0770	52,472
12/05/2012	7,216,259	0.03	0.0174	0.00221	0.0330	0.0158	ND	0.0684	6,451

"-" = Information not applicable or not available.
ND = not detected

Table 3
Cumulative Flow and Analytical Results
Former MP Shops
Sedalia, Missouri

Sample Date	Cumulative Volume	Average Flow Rate	cis-1,2-Dichloroethene (cis-1,2-DCE)	trans-1,2-Dichloroethene (trans-1,2-DCE)	Tetrachloroethene (PCE)	Trichloroethene (TCE)	Vinyl Chloride (VC)	Total Toxic Organics (TTO)	Period Discharge
	Gallons	GPM	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	Gallons
06/10/2013	7,273,775	0.21	0.00441	ND	0.00863	0.00379	ND	0.0168	57,516
12/18/2013	7,284,944	0.04	0.00990	0.00148	0.0202	0.0110	ND	0.0426	11,169
06/18/2014	7,303,757	0.07	0.01590	0.00227	0.0220	0.0115	0.0035	0.0552	18,813
12/15/2014	7,321,634	0.07	0.01120	0.00140	0.0159	0.00861	ND	0.0371	17,877
06/23/2015	7,363,281	0.15	0.00749	0.00152	0.0163	0.00874	ND	0.0341	41,647
12/07/2015	7,387,909	0.10	0.00928	0.00117	0.0150	0.00793	ND	0.0334	24,628
06/27/2016	7,437,551	0.17	0.0118	0.00202	0.0225	0.0129	ND	0.0492	49,642
12/27/2016	7,458,677	0.08	0.0084	0.00146	0.0191	0.0105	ND	0.0395	21,126
06/13/2017	7,492,904	0.14	0.0105	0.00202	0.0214	0.0118	ND	0.0457	34,227
12/20/2017	7,506,969	0.05	0.0135	0.00142	0.0266	0.0149	ND	0.0564	14,065
06/27/2018	7,532,684	0.09	0.0129	0.00241	0.0307	0.0189	0.00324	0.0682	25,715
12/11/2018	7,540,326	0.03	0.0142	0.00216	0.0223	0.0130	0.00138	0.0530	7,642
06/13/2019	7,589,412	0.19	0.0106	0.00170	0.0227	0.0111	ND	0.0461	49,086
12/10/2019	7,612,647	0.09	0.0110	0.00140	0.0166	0.0099	0.0013	0.0402	23,235
07/14/2020	7,665,054	0.17	0.0105	0.00190	0.0263	0.0127	0.0002 J	0.0514	52,407
12/16/2020	7,666,329	0.01	0.0036	0.00036 J	0.0038	0.0028	0.0016	0.0122	1,275

Notes:

1. On June 23, 2015, the pump and alarm notification system were found to not be properly working. The pump was repaired on June 24, 2015.
2. The recovery trench line was damaged around August 5, 2013 and repaired on April 25, 2014.
3. On December 7, 2009, it was discovered that the RS-1 system was not operating. A faulty surge suppressor was replaced and the system was restarted on December 21, 2009.
4. On June 21, 2006, a power outage occurred shutting off power to the pump. Power was restored on July 6, 2006.
5. On January 18, 2005, the RS-1 System was found vandalized. On March 22, 2005, system was back online with exception to flow meter.
6. On April 22, 2005, the RS-1 System was fully functional.
7. Extensive overhaul of pump and other parts performed during Q1 2004. Trench was restarted on March 31, 2004.
8. On December 14, 2003, the RS-1 System was saturated, pump was off and alarm system found vandalized.
9. On November 13, 2001, a power outage occurred shutting off power to the pump. Power was restored on Nov. 23, 2001.
10. The Accu-Flow meter was recalibrated for a 1-inch pipe on July 24, 2001.
11. The battery in the Accu-Flow meter was replaced and the meter reset to factory settings on April 30, 2001 .
12. The LED display in the control panel was not operating during the March 19, 2001 quarterly sampling event; therefore, Total Flow Volume and Flow Rate could not be read.
13. During the December 28, 2000, event, samples were not collected and the control panel was not operating due to extremely cold weather.
14. J Flag qualifier for estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

"-" = Information not applicable or not available.
ND = not detected

Attachment 1
Analytical Report

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

December 21, 2020

Robyn Hansen
GHD
3807 South 148th St
Omaha, NE 68144

RE: Project: 2365 SEDALIA MO-FORMER MP SHOP
Pace Project No.: 60357371

Dear Robyn Hansen:

Enclosed are the analytical results for sample(s) received by the laboratory on December 17, 2020. The results relate only to the samples included in this report. Results reported herein conform to the applicable TNI/NELAC Standards and the laboratory's Quality Manual, where applicable, unless otherwise noted in the body of the report.

The test results provided in this final report were generated by each of the following laboratories within the Pace Network:
- Pace Analytical Services - Kansas City

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Angie Brown
angie.brown@pacelabs.com
1(913)563-1402
Project Manager

Enclosures

cc: Jeffrey Cloud, GHD

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

CERTIFICATIONS

Project: 2365 SEDALIA MO-FORMER MP SHOP
Pace Project No.: 60357371

Pace Analytical Services Kansas
9608 Loiret Boulevard, Lenexa, KS 66219
Missouri Inorganic Drinking Water Certification #: 10090
Arkansas Drinking Water
Arkansas Certification #: 20-020-0
Arkansas Drinking Water
Illinois Certification #: 200030
Iowa Certification #: 118
Kansas/NELAP Certification #: E-10116
Louisiana Certification #: 03055
Nevada Certification #: KS000212020-2
Oklahoma Certification #: 9205/9935
Florida: Cert E871149 SEKS WET
Texas Certification #: T104704407-19-12
Utah Certification #: KS000212019-9
Illinois Certification #: 004592
Kansas Field Laboratory Accreditation: # E-92587
Missouri SEKS Micro Certification: 10070

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

SAMPLE SUMMARY

Project: 2365 SEDALIA MO-FORMER MP SHOP
Pace Project No.: 60357371

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60357371001	**WG-2365-RS1-201216**	Water	12/16/20 11:40	12/17/20 10:10
60357371002	**TRIP BLANK**	Water	12/16/20 08:00	12/17/20 10:10

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

SAMPLE ANALYTE COUNT

Project: 2365 SEDALIA MO-FORMER MP SHOP
Pace Project No.: 60357371

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60357371001	**WG-2365-RS1-201216**	EPA 5030B/8260	PGH	18	PASI-K
60357371002	**TRIP BLANK**	EPA 5030B/8260	PGH	18	PASI-K

PASI-K = Pace Analytical Services - Kansas City

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

SUMMARY OF DETECTION

Project: 2365 SEDALIA MO-FORMER MP SHOP
Pace Project No.: 60357371

Lab Sample ID / Method	Client Sample ID / Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
60357371001	**WG-2365-RS1-201216**					
EPA 5030B/8260	cis-1,2-Dichloroethene	3.6	ug/L	1.0	12/19/20 04:40	
EPA 5030B/8260	trans-1,2-Dichloroethene	0.36J	ug/L	1.0	12/19/20 04:40	
EPA 5030B/8260	Tetrachloroethene	3.8	ug/L	1.0	12/19/20 04:40	
EPA 5030B/8260	Trichloroethene	2.8	ug/L	1.0	12/19/20 04:40	
EPA 5030B/8260	Vinyl chloride	1.6	ug/L	1.0	12/19/20 04:40	
EPA 5030B/8260	Preservation pH	1.0		0.10	12/19/20 04:40	
60357371002	**TRIP BLANK**					
EPA 5030B/8260	Preservation pH	1.0		0.10	12/19/20 01:50	

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

PROJECT NARRATIVE

Project: 2365 SEDALIA MO-FORMER MP SHOP
Pace Project No.: 60357371

Method: **EPA 5030B/8260**
Description: 8260 MSV
Client: UPRR_GHD NE office
Date: December 21, 2020

General Information:
2 samples were analyzed for EPA 5030B/8260 by Pace Analytical Services Kansas City. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 695909

A matrix spike/matrix spike duplicate was not performed due to insufficient sample volume.

Additional Comments:

This data package has been reviewed for quality and completeness and is approved for release.

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

ANALYTICAL RESULTS

Project: 2365 SEDALIA MO-FORMER MP SHOP
Pace Project No.: 60357371

Sample: WG-2365-RS1-201216 **Lab ID: 60357371001** Collected: 12/16/20 11:40 Received: 12/17/20 10:10 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV	Analytical Method: EPA 5030B/8260								
	Pace Analytical Services - Kansas City								
n-Butylbenzene	ND	ug/L	1.0	0.26	1		12/19/20 04:40	104-51-8	
sec-Butylbenzene	ND	ug/L	1.0	0.22	1		12/19/20 04:40	135-98-8	
tert-Butylbenzene	ND	ug/L	1.0	0.18	1		12/19/20 04:40	98-06-6	
cis-1,2-Dichloroethene	**3.6**	ug/L	1.0	0.15	1		12/19/20 04:40	156-59-2	
trans-1,2-Dichloroethene	**0.36J**	ug/L	1.0	0.15	1		12/19/20 04:40	156-60-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	0.13	1		12/19/20 04:40	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	0.17	1		12/19/20 04:40	10061-02-6	
n-Hexane	ND	ug/L	10.0	0.27	1		12/19/20 04:40	110-54-3	
Methyl-tert-butyl ether	ND	ug/L	1.0	0.093	1		12/19/20 04:40	1634-04-4	
n-Propylbenzene	ND	ug/L	1.0	0.16	1		12/19/20 04:40	103-65-1	
Tetrachloroethene	**3.8**	ug/L	1.0	0.15	1		12/19/20 04:40	127-18-4	
Trichloroethene	**2.8**	ug/L	1.0	0.25	1		12/19/20 04:40	79-01-6	
Vinyl chloride	**1.6**	ug/L	1.0	0.25	1		12/19/20 04:40	75-01-4	
Xylene (Total)	ND	ug/L	3.0	0.54	1		12/19/20 04:40	1330-20-7	
Surrogates									
4-Bromofluorobenzene (S)	101	%	80-120		1		12/19/20 04:40	460-00-4	
1,2-Dichloroethane-d4 (S)	106	%	86-117		1		12/19/20 04:40	17060-07-0	
Toluene-d8 (S)	99	%	80-120		1		12/19/20 04:40	2037-26-5	
Preservation pH	**1.0**		0.10		1		12/19/20 04:40		

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 2365 SEDALIA MO-FORMER MP SHOP
Pace Project No.: 60357371

Sample: TRIP BLANK **Lab ID: 60357371002** Collected: 12/16/20 08:00 Received: 12/17/20 10:10 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV	Analytical Method: EPA 5030B/8260 Pace Analytical Services - Kansas City								
n-Butylbenzene	ND	ug/L	1.0	0.26	1		12/19/20 01:50	104-51-8	
sec-Butylbenzene	ND	ug/L	1.0	0.22	1		12/19/20 01:50	135-98-8	
tert-Butylbenzene	ND	ug/L	1.0	0.18	1		12/19/20 01:50	98-06-6	
cis-1,2-Dichloroethene	ND	ug/L	1.0	0.15	1		12/19/20 01:50	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	0.15	1		12/19/20 01:50	156-60-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	0.13	1		12/19/20 01:50	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	0.17	1		12/19/20 01:50	10061-02-6	
n-Hexane	ND	ug/L	10.0	0.27	1		12/19/20 01:50	110-54-3	
Methyl-tert-butyl ether	ND	ug/L	1.0	0.093	1		12/19/20 01:50	1634-04-4	
n-Propylbenzene	ND	ug/L	1.0	0.16	1		12/19/20 01:50	103-65-1	
Tetrachloroethene	ND	ug/L	1.0	0.15	1		12/19/20 01:50	127-18-4	
Trichloroethene	ND	ug/L	1.0	0.25	1		12/19/20 01:50	79-01-6	
Vinyl chloride	ND	ug/L	1.0	0.25	1		12/19/20 01:50	75-01-4	
Xylene (Total)	ND	ug/L	3.0	0.54	1		12/19/20 01:50	1330-20-7	
Surrogates									
4-Bromofluorobenzene (S)	101	%	80-120		1		12/19/20 01:50	460-00-4	
1,2-Dichloroethane-d4 (S)	101	%	86-117		1		12/19/20 01:50	17060-07-0	
Toluene-d8 (S)	100	%	80-120		1		12/19/20 01:50	2037-26-5	
Preservation pH	**1.0**		0.10		1		12/19/20 01:50		

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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QUALITY CONTROL DATA

Project: 2365 SEDALIA MO-FORMER MP SHOP
Pace Project No.: 60357371

QC Batch: 695909
QC Batch Method: EPA 5030B/8260
Analysis Method: EPA 5030B/8260
Analysis Description: 8260 MSV Water 10 mL Purge
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60357371001, 60357371002

METHOD BLANK: 2809419 Matrix: Water
Associated Lab Samples: 60357371001, 60357371002

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
cis-1,2-Dichloroethene	ug/L	ND	1.0	0.15	12/19/20 01:22	
cis-1,3-Dichloropropene	ug/L	ND	1.0	0.13	12/19/20 01:22	
Methyl-tert-butyl ether	ug/L	ND	1.0	0.093	12/19/20 01:22	
n-Butylbenzene	ug/L	ND	1.0	0.26	12/19/20 01:22	
n-Hexane	ug/L	ND	10.0	0.27	12/19/20 01:22	
n-Propylbenzene	ug/L	ND	1.0	0.16	12/19/20 01:22	
sec-Butylbenzene	ug/L	ND	1.0	0.22	12/19/20 01:22	
tert-Butylbenzene	ug/L	ND	1.0	0.18	12/19/20 01:22	
Tetrachloroethene	ug/L	ND	1.0	0.15	12/19/20 01:22	
trans-1,2-Dichloroethene	ug/L	ND	1.0	0.15	12/19/20 01:22	
trans-1,3-Dichloropropene	ug/L	ND	1.0	0.17	12/19/20 01:22	
Trichloroethene	ug/L	ND	1.0	0.25	12/19/20 01:22	
Vinyl chloride	ug/L	ND	1.0	0.25	12/19/20 01:22	
Xylene (Total)	ug/L	ND	3.0	0.54	12/19/20 01:22	
1,2-Dichloroethane-d4 (S)	%	103	86-117		12/19/20 01:22	
4-Bromofluorobenzene (S)	%	101	80-120		12/19/20 01:22	
Toluene-d8 (S)	%	99	80-120		12/19/20 01:22	

LABORATORY CONTROL SAMPLE: 2809420

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
cis-1,2-Dichloroethene	ug/L	20	20.1	100	85-115	
cis-1,3-Dichloropropene	ug/L	20	21.0	105	85-117	
Methyl-tert-butyl ether	ug/L	20	21.1	105	77-126	
n-Butylbenzene	ug/L	20	21.0	105	81-120	
n-Hexane	ug/L	20	19.9	100	41-144	
n-Propylbenzene	ug/L	20	21.2	106	80-116	
sec-Butylbenzene	ug/L	20	22.4	112	75-130	
tert-Butylbenzene	ug/L	20	21.6	108	84-116	
Tetrachloroethene	ug/L	20	21.1	105	83-119	
trans-1,2-Dichloroethene	ug/L	20	19.1	96	80-124	
trans-1,3-Dichloropropene	ug/L	20	18.5	93	83-117	
Trichloroethene	ug/L	20	22.1	110	80-118	
Vinyl chloride	ug/L	20	21.2	106	76-144	
Xylene (Total)	ug/L	60	63.9	106	82-120	
1,2-Dichloroethane-d4 (S)	%			102	86-117	
4-Bromofluorobenzene (S)	%			99	80-120	
Toluene-d8 (S)	%			100	80-120	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
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QUALIFIERS

Project: 2365 SEDALIA MO-FORMER MP SHOP
Pace Project No.: 60357371

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

BATCH QUALIFIERS

Batch: 695909

[M5] A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 2365 SEDALIA MO-FORMER MP SHOP
Pace Project No.: 60357371

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60357371001	**WG-2365-RS1-201216**	EPA 5030B/8260	695909		
60357371002	**TRIP BLANK**	EPA 5030B/8260	695909		

Pace Analytical
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Sample Condition Upon Receipt

WO# : 60357371

60357371

Client Name: UPRR Cuthbert Office

Courier: FedEx ☒ UPS ☐ VIA ☐ Clay ☐ PEX ☐ ECI ☐ Pace ☐ Xroads ☐ Client ☐ Other ☐

Tracking #: 9308 4707 7244 Pace Shipping Label Used? Yes ☐ No ☒

Custody Seal on Cooler/Box Present: Yes ☒ No ☐ Seals intact: Yes ☑ No ☐

Packing Material: Bubble Wrap ☐ Bubble Bags ☑ Foam ☐ None ☐ Other ☐

Thermometer Used: T298 **Type of Ice:** Wet Blue None

Cooler Temperature (°C): **As-read** 2.6 **Corr. Factor** -0.2 **Corrected** 2.4

Date and initials of person examining contents: 12/30/21 K

Temperature should be above freezing to 6°C

Chain of Custody present:	☑Yes ☐No ☐N/A	
Chain of Custody relinquished:	☑Yes ☐No ☐N/A	
Samples arrived within holding time:	☑Yes ☐No ☐N/A	
Short Hold Time analyses (<72hr):	☐Yes ☒No ☐N/A	
Rush Turn Around Time requested:	☐Yes ☒No ☐N/A	
Sufficient volume:	☑Yes ☐No ☐N/A	
Correct containers used:	☑Yes ☐No ☐N/A	
Pace containers used:	☑Yes ☐No ☐N/A	
Containers intact:	☑Yes ☐No ☐N/A	
Unpreserved 5035A / TX1005/1006 soils frozen in 48hrs?	☐Yes ☐No ☑N/A	
Filtered volume received for dissolved tests?	☐Yes ☐No ☑N/A	
Sample labels match COC: Date / time / ID / analyses	☑Yes ☐No ☐N/A	
Samples contain multiple phases? Matrix: WT	☐Yes ☑No ☐N/A	
Containers requiring pH preservation in compliance? (HNO_3, H_2SO_4, HCl<2; NaOH>9 Sulfide, NaOH>10 Cyanide) (Exceptions: VOA, Micro, O&G, KS TPH, OK-DRO) LOT#	☐Yes ☐No ☑N/A	List sample IDs, volumes, lot #'s of preservative and the date/time added.
Cyanide water sample checks: Lead acetate strip turns dark? (Record only)	☐Yes ☐No	
Potassium iodide test strip turns blue/purple? (Preserve)	☐Yes ☐No	
Trip Blank present:	☑Yes ☐No ☐N/A	2 DGAH
Headspace in VOA vials (>6mm):	☐Yes ☒No ☐N/A	
Samples from USDA Regulated Area: State:	☐Yes ☐No ☑N/A	
Additional labels attached to 5035A / TX1005 vials in the field?	☐Yes ☐No ☑N/A	

Client Notification/ Resolution: Copy COC to Client? Y / N Field Data Required? Y / N

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

Project Manager Review: _____ Date: _____

Pace Analytical

CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Section A
Required Client Information:
Company: UPRR_GHD NE office
Address: 3807 South 148th St
Omaha, NE 68144
Email:
Phone: (402) 778-4801 Fax:
Requested Due Date:

Section B
Required Project Information:
Report To: Hansen, Robyn
Copy To:
Purchase Order #: 2365-24
Project Name: UP 2365 Sedalia MO-Former MP Shops
Project #: Well Installation

Section C
Invoice Information:
Attention: Melissa Schop
Company Name: UPRR Railaways
Address: Omaha, NE
Pace Quote:
Pace Project Manager: angie.brown@pacelabs.com,
Pace Profile #: 12417

Regulatory Agency
State / Location: MO

ITEM #	SAMPLE ID (One Character per box. (A-Z, 0-9 / , -) Sample Ids must be unique)	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED START DATE	COLLECTED START TIME	COLLECTED END DATE	COLLECTED END TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H2SO4	HNO3	HCl	NaOH	Na2S2O3	Methanol	Other	Analyses Test: 8260 soil full list	Y/N	TRICHLOROETHYENE	TETRA CHLORO-ETHYLENE	VINYL CHLORIDE	TRANS-1,2-DICH-LOROETHYLENE	CIS-1,2-DICH-LOROETHYLENE	Residual Chlorine (Y/N)
1	WG-2365-RSI-201216	WT	G	12/16	11:30	12/16	11:40		6				✓						N	✓	✓	✓	✓	✓	60367371
2																									
3																									
4																									
5																									
6																									
7																									
8																									
9																									
10																									
11																									
12																									

MATRIX CODE: Drinking Water DW; Water WT; Waste Water WW; Product P; Soil/Solid SL; Oil OL; Wipe WP; Air AR; Other OT; Tissue TS

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
	David Gehm / GHD	12/16/20	12:45	Pace ROC	12/17/20	1010	2.4	Y	Y	Y

SAMPLER NAME AND SIGNATURE
PRINT Name of SAMPLER: DAVID GEHM
SIGNATURE of SAMPLER: David Gehm
DATE Signed: 12/16/2020

TEMP in C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)

Attachment 2
Data Validation Report

Memorandum

January 8, 2021

To:	Robyn Hansen	Ref. No.:	11183954-95-08-2365
From:	Jeffrey Cloud/eew/850-NF	Tel:	206-914-3141
cc:	Jesse Orth, Julie Lidstone		

Subject: **Analytical Results and Reduced Validation of Report 60357371**
Semiannual Discharge Monitoring
Union Pacific Railroad (UPRR) – Former MP Shops
Sedalia, Missouri
December 2020

1. Introduction

This document details a reduced validation of analytical results for a groundwater sample collected in support of the Semiannual Discharge Monitoring at the Former MP Shops site in Sedalia, Missouri during December 2020. The sample was submitted to Pace Analytical Services, located in Lenexa, Kansas. A sample collection and analysis summary is presented in Table 1. A summary of the analytical methodology is presented in Table 2. The validated analytical results are summarized in Table 3.

Standard GHD report deliverables were submitted by the laboratory. The final results and supporting quality assurance/quality control (QA/QC) data were assessed. Evaluation of the data was based on information obtained from the chain of custody form, finished report forms, method blank data, recovery data from surrogate spikes, laboratory control samples and field QC samples.

The QA/QC criteria by which these data have been assessed are outlined in the analytical method referenced in Table 2 and applicable guidance from the document entitled "USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review", United States Environmental Protection Agency (USEPA) 540 R 2016 002, September 2016.

2. Sample Holding Time and Preservation

The sample holding time criterion and sample preservation requirements for the analysis are summarized in the method. The sample chain of custody document and analytical report were used to determine sample holding times. The sample was analyzed within the required holding time.

All sample containers were properly preserved, delivered on ice and stored by the laboratory at the required temperature (0-6°C).

3. Laboratory Method Blank Analyses

Method blanks are prepared from a purified matrix and analyzed with investigative samples to determine the existence and magnitude of sample contamination introduced during the analytical procedures.

For this study, laboratory method blanks were analyzed at a minimum frequency of 1 per analytical batch.

All method blank results were non-detect, indicating that laboratory contamination was not a factor for this investigation.

4. Surrogate Spike Recoveries

In accordance with the method employed, all samples, blanks, and QC samples analyzed for organics are spiked with surrogate compounds prior to sample analysis. Surrogate recoveries provide a means to evaluate the effects of laboratory performance on individual sample matrices.

The sample submitted for volatile organic compound (VOC) analysis was spiked with the appropriate number of surrogate compounds prior to sample analysis.

Surrogate recoveries were assessed against the control limits. All surrogate recoveries met the associated criteria.

5. Laboratory Control Sample Analyses

Laboratory control samples (LCS) are prepared and analyzed as samples to assess the analytical efficiencies of the method employed, independent of sample matrix effects.

For this study, an LCS was analyzed at a minimum frequency of 1 per analytical batch.

The LCS contained all analytes of interest. All LCS recoveries were within associated control limits, demonstrating acceptable analytical accuracy.

6. Field QA/QC Samples

The field QA/QC consisted of one trip blank sample.

To evaluate contamination from sample collection, transportation, storage, and analytical activities, one trip blank was submitted to the laboratory for analysis. All results were non-detect for the analytes of interest.

7. Analyte Reporting

The laboratory reported detected results down to the laboratory's method detection limit (MDL) for each analyte. The positive analyte detection less than the reporting limit (RL) but greater than the MDL was reported as estimated (J) in Table 3. Non-detect results were presented as non-detect at the RL in Table 3.

8. Conclusion

Based on the assessment detailed in the foregoing, the summarized data are acceptable without qualification.

Table 1

Sample Collection and Analysis Summary
Semiannual Discharge Monitoring
Union Pacific Railroad (UPRR) - Former MP Shops
Sedalia, Missouri
December 2020

					Analysis/Parameters	
Sample Identification	**Location**	**Matrix**	**Collection Date (mm/dd/yyyy)**	**Collection Time (hr:min)**	**VOCs**	**Comments**
WG-2365-RS1-201216	RS-1 Trench Manhole	Water	12/16/2020	11:40	X	
TRIP BLANK	--	Water	12/16/2020	--	X	Trip Blank

Notes:

VOCs - Volatile Organic Compounds
"--" - Not Applicable

Table 2

Analytical Methods
Semiannual Discharge Monitoring
Union Pacific Railroad (UPRR) - Former MP Shops
Sedalia, Missouri
December 2020

Parameter	Method	Matrix
Volatile Organic Compounds (VOCs)	SW-846 8260[(1)]	Water

Notes:

(1) - SW-846 - "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", SW-846, Third Edition, 1986, with subsequent revisions

Table 3

Analytical Results Summary
Semiannual Discharge Monitoring
Union Pacific Railroad (UPRR) - Former MP Shops
Sedalia, Missouri
December 2020

Location ID:	**RS-1 Trench Manhole**
Sample Name:	**WG-2365-RS1-201216**
Sample Date:	**12/16/2020**

Parameters	**Unit**	
Volatile Organic Compounds		
2-Phenylbutane (sec-Butylbenzene)	µg/L	<1.0
cis-1,2-Dichloroethene	µg/L	3.6
cis-1,3-Dichloropropene	µg/L	<1.0
Hexane	µg/L	<10.0
Methyl tert butyl ether (MTBE)	µg/L	<1.0
N-Butylbenzene	µg/L	<1.0
N-Propylbenzene	µg/L	<1.0
tert-Butylbenzene	µg/L	<1.0
Tetrachloroethene	µg/L	3.8
trans-1,2-Dichloroethene	µg/L	0.36 J
trans-1,3-Dichloropropene	µg/L	<1.0
Trichloroethene	µg/L	2.8
Vinyl chloride	µg/L	1.6
Xylenes (total)	µg/L	<3.0

Notes:

< - Not detected at the associated reporting limit

J - Estimated concentration